

CLAIMS:

1. A portable communication device comprising:
 - an earpiece speaker,
 - a loudspeaker,

5 a circuit coupled to the earpiece speaker, and the loudspeaker, said circuit comprising:
 - a signal source for generating a signal for driving the loudspeaker, wherein said signal source is coupled to the loudspeaker; and
 - a cancellation filter, wherein said signal source is further coupled to the earpiece speaker through a cancellation filter.

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- 2. The portable communication device according to claim 1 further comprising:
 - a common acoustic resonator coupled to the earpiece speaker, and to the loudspeaker.

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- 3. The portable communication device according to claim 1 wherein:
 - the cancellation filter comprises a digital filter.

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- 4. The portable communication device according to claim 3 wherein:
 - the circuit comprises, a processor;
 - the signal source comprises a software implemented signal source; and
 - the cancellation filter comprises a software implemented digital filter.

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- 5. A portable communication device comprising:
 - an earpiece speaker;
 - a loudspeaker;
 - an acoustic resonator acoustically coupled to the earpiece speaker and the loudspeaker;
 - a first amplifier drivingly coupled to the earpiece speaker;
 - a second amplifier drivingly coupled to the loudspeaker;
 - 30 a first digital to analog converter drivingly coupled to the first amplifier;

a second digital to analog converter drivingly coupled to the second amplifier; a processor coupled to the first digital to analog converter, and coupled to the second digital to analog converter wherein the processor is programmed to:

5 apply a loudspeaker drive signal to the second digital to analog converter; apply a cancellation filter to the drive signal to obtain a cancellation filtered drive signal; and

apply the cancellation filtered drive signal to the first analog to digital converter.

10 6. The portable communication device according to claim 5 wherein:

in applying the cancellation filter to the drive signal, the processor is programmed to apply a finite impulse response filter to the drive signal.

15 7. The portable communication device according to claim 5 wherein:

the acoustic resonator comprises an opening for coupling acoustic energy from the earpiece speaker to a user's ear.

20 8. A method of operating a portable communication device, the method comprising:

applying a drive signal to a loudspeaker of the portable communication device;

cancellation filtering the drive signal with a cancellation filter to obtain a cancellation filtered drive signal;

25 driving an earpiece speaker of the portable communication device with the cancellation filtered drive signal;

whereby, a level of sound emanating from the loudspeaker, and coupled to a user's ear is reduced.

30 9. The method according to claim 8 further comprising:

prior to applying the drive signal to the loudspeaker, delaying the drive signal.

10. The method according to claim 8 wherein:

cancellation filtering comprises, filtering with a cancellation filter that is characterized by a first frequency response that, when compounded with a second frequency response that characterizes electrical to acoustic transducing response of the earpiece speaker, substantially negates a third frequency response that characterizes electrical to acoustic transducing response of the loudspeaker as measured with an ear simulator.

11. The method according to claim 10 wherein:

10 cancellation filtering comprises digitally filtering with a finite impulse response filter.